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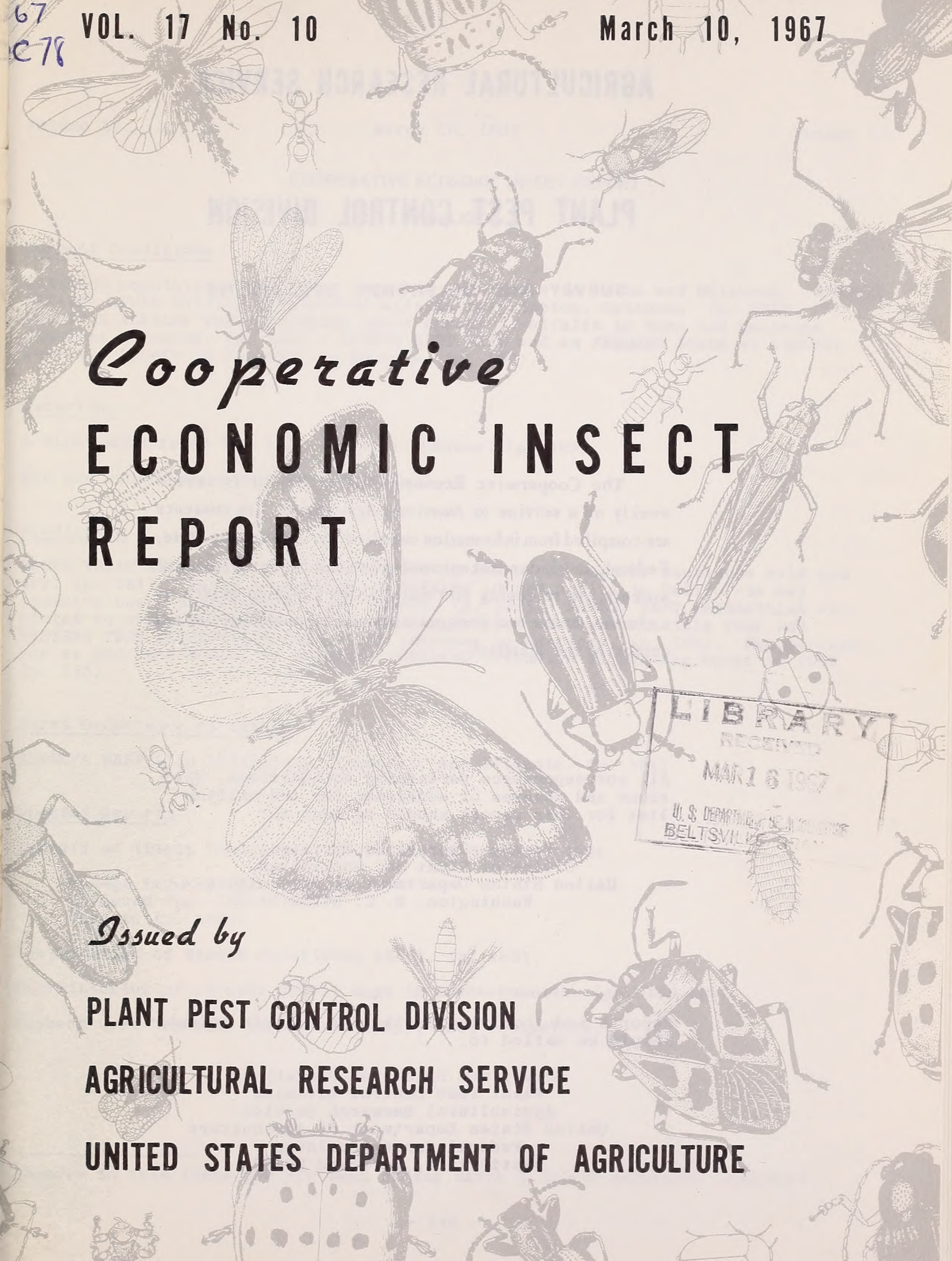

Cooperative ECONOMIC INSECT REPORT

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PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 17 March 10, 1967 Number 10

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

GREENBUG populations severe on wheat in some areas of Texas and Oklahoma. SPOTTED ALFALFA APHID killing fall-seeded alfalfa near Tipton, Oklahoma. (p. 151). EGYPTIAN ALFALFA WEEVIL causing heavy damage to alfalfa in Yuma and Maricopa Counties, Arizona. (p. 152). CITRUS RUST MITE and an ARMORED SCALE at highest February levels in 16 years in Florida. (p. 153).

Detection

A PLUME MOTH found for first time in Indiana. (p. 153).

For new county records see page 157.

Prediction

BROWN WHEAT MITE could present problems in Kansas if weather continues mild and dry. (p. 151). Early collection of ALFALFA LOOPER adults in California may indicate heavy infestations this season. (p. 152). FOREST TENT CATERPILLAR expected to cause heavy defoliation in larger area of Minnesota this year and EASTERN TENT CATERPILLAR damage may increase in Kentucky. (p. 155). Egg surveys for an OAK LEAF ROLLER in Virginia indicate extensive damage may occur in 1967. (p. 155).

First Occurrence of Season

ALFALFA WEEVIL in California, Missouri, and Illinois. (p. 151).

Special Reports

Summary of Insect Conditions in the United States - 1966

Forage Legumes (pp. 159-164).
Soybeans (pp. 164-167).
Peanuts (p. 167).

Distribution of Meadow Spittlebug (Map). (p. 165).

Overwintering of Alfalfa Weevil Eggs in Massachusetts. (pp. 168-170).

Soybean Cyst Nematode Quarantine (Map). See centerfold.

Reports in this issue are for week ending March 3 unless otherwise indicated.

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WEATHER BUREAU'S 30-DAY OUTLOOK

MARCH 1967

The Weather Bureau's 30-day outlook for March calls for temperatures to average below seasonal normals in the Great Lakes region and the Northeast as well as in the Southwest and the central Pacific coast. Above normal temperatures are indicated for the Southeast and also for the northern Plains while near normal temperatures are called for elsewhere. Precipitation is expected to exceed normal over the Pacific Northwest and also over the eastern half of the Nation except for near to below normal totals in the south and middle Atlantic Coast States. Subnormal precipitation is indicated for portions of the northern and southern Plains while near normal precipitation is in prospect in unspecified areas.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D. C. 20250. Price $5.00 a year.

For weather of the week see page 157.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

GREENBUG (Schizaphis graminum) - TEXAS - Increased markedly in past 2 weeks but remained noncritical. Light to heavy populations spotty in High Plains wheat area, with isolated counts up to 250 per linear foot in Swisher and Hale Counties. (Texas Coop. Rpt.). In Swisher County, 3,000-4,000 aphids per foot infested irrigated wheat. Situation under control with chemicals. (Daniels). ARKANSAS - Numbers low, but have increased; increase likely to continue. (Ark. Ins. Sur.). OKLAHOMA - Increased in southwest area. Ranged 20-80 per linear foot in Tillman County wheat; 20-40 and occasionally 200-275 per linear foot in Stephens County. Latter fields showing typical feeding damage. Averaged 30 per linear foot in McCurtain County; heavy in Oklahoma County but light in Kingfisher. (Okla. Coop. Sur.). KANSAS - Light, 2-5 per linear foot, in several Seward County wheat fields. (DePew).

CORN LEAF APHID (Rhopalosiphum maidis) - ARIZONA - Moderate on small grains in Yuma, Maricopa and Pinal Counties. (Ariz. Coop. Sur.). NEW MEXICO - Light on Dona Ana County barley. (Campbell, Nielsen).

SPOTTED ALFALFA APHID (Therioaphis maculata) - OKLAHOMA - Up to 80 per plant killing fall-seeded alfalfa in Tipton area of Tillman County. Averaged 32 per square foot of crown in Lincoln County. (Okla. Coop. Sur). ARKANSAS - Easily found in northwest area; previously very scarce. (Ark. Ins. Sur.).

ARMY CUTWORM (Chorizagrotis auxiliaris) - KANSAS - Occasional larva found in few wheat fields in Logan, Wallace and Greeley Counties. (Simpson).

SMALL GRAINS

BROWN WHEAT MITE (Petrobia latens) - TEXAS - Present on small grains in several panhandle counties. (Daniels). OKLAHOMA - Numbers per square foot of wheat by county: Tillman 200-1500, Comanche 250-350, Stephens 200-800. (Okla. Coop. Sur.). KANSAS - Light to moderate in Haskell, Stevens and Seward Counties. Could present problems if weather continues mild and dry. (DePew).

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - Ranged 175-400 per linear foot on wheat in northern Tillman County. (Okla. Coop. Sur.).

AN APHID (Rhopalosiphum padi) - OKLAHOMA - Ranged up to 100 per linear foot of wheat in scattered Stephens County fields; 0-5 in Tillman County, and 40 in McCurtain County. (Okla. Coop. Sur.).

ENGLISH GRAIN APHID (Macrosiphum avenae) - ARKANSAS - Continues low on wheat in northwest area. (Ark. Ins. Sur.).

FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - CALIFORNIA - Beginning to damage alfalfa in Colusa and Glenn Counties. (Jenkins). MISSISSIPPI - Heavy, approximately 40-50 larvae per square foot, on 15 acres of alfalfa in Sunflower County. Heavily damaged young leaves. (Dinkins). MISSOURI - First larvae of season observed in southeast section. Alfalfa too short for sweep counts. First and second-stage larvae averaged 8-10 per square foot in fields checked. (Munson). ILLINOIS - First to third-stage larvae ranged 5-40 per square foot on alfalfa in Pope County; 10-20 in Massac County and 8 in Harding County. Alfalfa measured 2-4 inches and temperature ranged 60-70°. Two adults per 100 sweeps collected in Pope County. (Armbrust, Moore). VIRGINIA - Single square-foot sample of alfalfa collected at Charlotte Courthouse, Charlotte County. Of 215 eggs found, 161 hatched and 54 unhatched. Of 67 larvae found, 28 were alive. Some feeding signs observed, but no weevils found. No feeding signs observed at Shenandoah Valley Research Station, Rockbridge County. (Woodside).

EGYPTIAN ALFALFA WEEVIL (Hypera brunneipennis) - ARIZONA - Increasing rapidly. Larvae damaged 40-100 percent of alfalfa terminals in Yuma County and 10-45 percent in Maricopa County. (Ariz. Coop. Sur.).

CLOVER LEAF WEEVIL (Hypera punctata) - ILLINOIS - Larvae ranged 4-12 per square foot in 2 to 4-inch alfalfa in Massac, Pope, and Hardin Counties. (Armbrust, Moore).

ALFALFA LOOPER (Autographa californica) - CALIFORNIA - Adults collected in light trap at La Grange, Stanislaus County, for unusually early record. This may indicate season of heavy infestations. (Cal. Coop. Rpt.).

PEA APHID (Acyrthosiphon pisum) - ARIZONA - Increased on alfalfa in Yuma, Maricopa and Pinal Counties. Averaged 5,000 per 100 sweeps. (Ariz. Coop. Sur.). OKLAHOMA - Averaged as low as 20 per square foot on some alfalfa in Stephens County, and as high as 800 per square foot in other fields, especially fall-seeded alfalfa. Averaged 12 per square foot in Lincoln County. (Okla. Coop. Sur.). ARKANSAS - Increased; ranged 30-50 per square foot on vetch in Washington County. (Ark. Ins. Sur.). ILLINOIS - Occasional specimens observed in 2 to 4-inch alfalfa in southeast section. (Armbrust, Moore).

LYGUS BUGS (Lygus spp.) - NEW MEXICO - Adults light in Chaves County alfalfa. (Mathews).

SUGARBEETS

BEET ARMYWORM (Spodoptera exigua) - ARIZONA - Larvae light, but increased on sugarbeets in Pinal and Maricopa Counties. Controls unnecessary. (Ariz. Coop. Sur.).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Increased in Maricopa County, particularly in western area. (Ariz. Coop. Sur.).

MISCELLANEOUS FIELD CROPS

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Moderate, 4 per leaf, on new safflower leaves in Yuma and Maricopa Counties. (Ariz. Coop. Sur.).

LYGUS BUGS (Lygus spp.) - ARIZONA - Nymphs light to moderate on most safflower in Maricopa County. (Ariz. Coop. Sur.).

POTATOES, TOMATOES, PEPPERS

POTATO APHID (Macrosiphum euphorbiae) - IOWA - Very high populations damaged greenhouse tomatoes in Creston, Union County. (Iowa Ins. Sur.).

CUCURBITS

CITRUS MEALYBUG (Planococcus citri) - CALIFORNIA - Heavy on black calabash squash in nursery at Fresno, Fresno County. (Cal. Coop. Rpt.).

GENERAL VEGETABLES

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Continues moderate on lettuce in Maricopa and Yuma Counties. (Ariz. Coop. Sur.).

THRIPS - NEW MEXICO - Increasing on mature onions but very light on seedlings. (Campbell, Elson).

DECIDUOUS FRUITS AND NUTS

LESSER PEACH TREE BORER (*Synanthedon pictipes*) - MISSISSIPPI - Larvae light to medium on peach in Oktibbeha and surrounding counties; infestation 75 percent on one orchard. Second and third-stage larvae and some pupae observed. (Dinkins).

BLACK PEACH APHID (*Brachycaudus persicaecola*) - CALIFORNIA - Medium on peach trees at Paradise, Butte County. (Cal. Coop. Rpt.).

CITRUS

Citrus Insect Situation in Florida - End of February 1967 - CITRUS RUST MITE (*Phyllocoptruta oleivora*) infested 71 percent of groves (norm 58 percent); 54 percent economic (norm 35 percent). Population continued in high range and is at highest February level recorded in 16 years; will remain high. High in all districts. CITRUS RED MITE (*Panonychus citri*) infested 56 percent of groves (norm 34 percent); 27 percent economic (norm 12 percent). Population above average and in moderate range. Decrease expected. Highest districts west and north. TEXAS CITRUS MITE (*Eutetranychus banksi*) infested 49 percent of groves (norm 26 percent); 29 percent economic (norm 8 percent). This mite continues at record high level for February. Population still in moderate range and expected to hold near current level. Highest districts west and north. GLOVER SCALE (*Lepidosaphes gloverii*) infested 84 percent of groves; 17 percent economic. Population near normal and in high range. Slight increase expected. Highest districts east, central and south. PURPLE SCALE (*L. beckii*) infested 80 percent of groves; 11 percent economic. This scale near normal moderate abundance. Will increase slightly but will not produce heavy infestations. Highest district central. YELLOW SCLAE (*Aonidiella citrina*) infested 70 percent of groves; 10 percent economic. Population near normal and in moderate range with little change expected. Highest districts central and east. CHAFF SCALE (*Parlatoria pergandii*) infested 59 percent of groves; 4 percent economic. Population below normal and low with little change expected. Highest district east. BLACK SCALE (*Saissetia oleae*) infested 46 percent of groves; 12 percent economic. Population above normal for February but in low range. Slight increase expected. Highest district east. An ARMORED SCALE (*Unaspis citri*) infested 6 percent of groves; 3 percent have moderate or heavy infestations. Population has increased during past 4 years and is now at highest level in 16 years of record. All infestations of this pest should be considered of economic importance because of potential for spread and difficulty of control. WHITEFLIES and MEALYBUGS near normal low levels of abundance. A few APHIDS have appeared in scattered groves. (W. A. Simanton (Citrus Expt. Sta., Lake Alfred, Fla.)).

OTHER TROP. & SUBTROP. FRUITS

FIG SCALE (*Lepidosaphes ficus*) - CALIFORNIA - Adults light on 5 acres of fig trees in Clovis, Fresno County. Normally, this scale is held in check biologically. (Cal. Coop. Rpt.).

ORNAMENTALS

A PLUME MOTH (*Platyptilia pica*) - INDIANA - In Putnam County, larvae and pupae found on greenhouse geranium cuttings from out of State. This is a new State record. (Favinger).

GRANULATE CUTWORM (*Feltia subterranea*) - ARIZONA - Larger than normal populations damaged ornamentals in the Phoenix area of Maricopa County. (Ariz. Coop. Sur.).

ARMORED SCALES - MARYLAND - Unaspis euonymi heavy on euonymus at location in Silver Spring, Montgomery County. (U. Md., Ent. Dept.). FLORIDA - Comstockiella sabalis infested cabbage palm at nursery in Cross City, Dixie County. This is a new county record. (Graham, Feb. 22). ALABAMA - Crawler activity of Fiorinia theae increased during past 2 weeks on Burford holly and camellia in central and southern sections. Aspidiotus perniciosus heavy on 20 percent of flowering crab apple in Lee County. (McQueen). CALIFORNIA - Hemiberlesia rapax heavy on euonymus at Ramona, San Diego County, and at Davis, Yolo County. (Cal. Coop. Rpt.).

SOFT SCALES - FLORIDA - Toumeyella liriodendri adults severe on 100 sweetbay nursery plants at Thonotosassa, Hillsborough County; caused much twig and stem die-back. (Simmons et al.). Coccus hesperidum collected on stem and leaves of monstera at nursery in Cross City, Dixie County, February 15. This is a new host record. (Graham). CALIFORNIA - Saissetia oleae heavy on euonymus in Ramona, San Diego County. (Cal. Coop. Rpt.).

MEALY BUGS - CALIFORNIA - Pseudococcus obscurus adults heavy on Eucharis grandiflora nursery stock in San Bruno, San Mateo County. Spilococcus cactearum heavy on a cactus locally in Sacramento, Sacramento County. (Cal. Coop. Rpt.).

APHIDS - ALABAMA - Overwintering Eriosoma lanigerum heavy on roots of several flowering crab apple trees in Lee County. (McQueen). ARIZONA - Macrosiphoniella sanborni increased on and damaged ornamentals in Phoenix area of Maricopa County. (Ariz. Coop. Sur.).

AN ERIOPHYID MITE (Paracalacarus podocarpi) - FLORIDA - Adults moderate on 10 percent of 2,500 Japanese yews at nursery in West Hollywood, Broward County. New growth was stunted. (Hickman, Cervone, Feb. 15).

FOREST AND SHADE TREES

BLACK TURPENTINE BEETLE (Dendroctonus terebrans) - OKLAHOMA - Infesting occasional pine trees near America, McCurtain County. Most infested trees have been cut. (Okla. Coop. Sur.).

SOUTHERN PINE BEETLE (Dendroctonus frontalis)-Populations continue on following National Forests: Francis Marion in South Carolina, Homochitto in Mississippi and Talladega in Alabama. On private lands, epidemic populations continue in Alabama, Louisiana, North Carolina and Texas. Also found on the Bankhead National Forest and in Clarke County, Alabama, for the first time in several years. (South. For. Pest Rptr., Feb. Sum.).

PINE BARK APHID (Pineus strobi) - MARYLAND - Light to medium on young white pines at Laurel, Prince Georges County. (U. Md., Ent. Dept.).

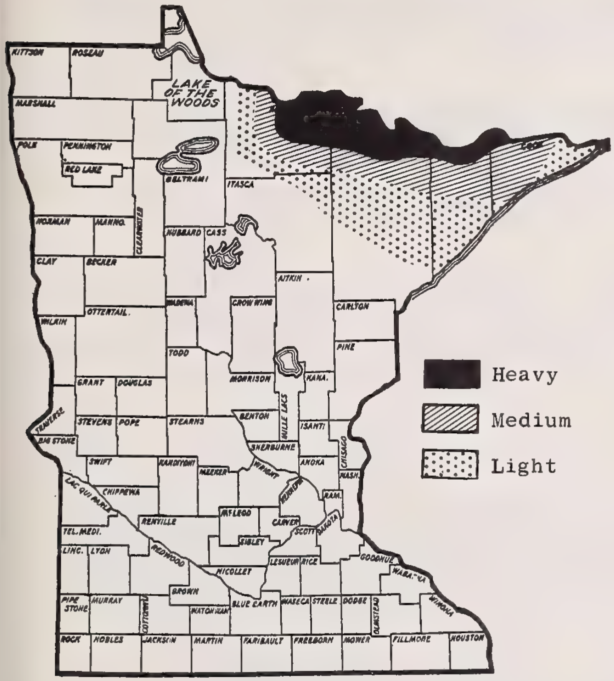
A PINE APHID (Cinara sp.) - OKLAHOMA - Heavy on pines in many areas of McCurtain and Pushmataha Counties in mid-February. Trees checked this period show parasites and birds completely destroyed most infestations. (Okla. Coop. Sur.).

SEED AND CONE INSECTS - Overall damage to cones was much higher in Louisiana during 1966. Treated shortleaf pine seed production areas in Arkansas showed an increase in seed and cone production when compared with untreated checks. Most common insects infesting seeds and cones in Arkansas, Louisiana, North Carolina and South Carolina were Dioryctria spp., Laspeyresia spp. and a coneworm Eucosma sp. A chloropid fly, Hapleginella conicola, was collected from cones infested by cecidomyiid midges in North Carolina. This may be first recovery of this insect from shortleaf pine cones. (South For. Pest Rptr., Feb. Sum.).

AN ARMORED SCALE (Phenacaspis heterophyllae) - FLORIDA - Collected on loblolly pine at Melrose, Putnam County, February 24. This is a new county record. (Graham).

FOREST TENT CATERPILLAR (*Malacosoma disstria*) - MINNESOTA - This pest has caused heavy defoliation on broadleaf trees since 1964 in the north-central area. Since that date, infestation has spread very slowly. The 1967 defoliation prediction is illustrated on accompanying map. This predication is based on 3 surveys: An aerial defoliation survey in early July 1966, a light trap survey for moth distribution during entire month of July and an egg mass survey conducted from October 15 to January 1. (Minn. Ins. Rpt.).

Forest tent Caterpillar Defoliation
Prediction in Minnesota - 1967



EASTERN TENT CAPERPILLAR (*Malacosoma americanum*) - KENTUCKY - A statewide egg-mass survey was conducted in portions of Letcher, Morgan, Menifee, Powell, Bath, Montgomery, Marion, Taylor, Casey, Green and Adair Counties. Intensity of damage may increase compared with 1966. (South. For. Pest Rptr., Feb. Sum).

CALIFORNIA OAKWORM (*Phryganidia californica*) - CALIFORNIA - Larvae heavy on oak trees at St. Helena and Yountville, Napa County. Larvae about one-third grown. Early occurrence of larvae indicates another year of severe defoliation unless virus diease currently present in some specimens becomes effective. (Cal. Coop. Rpt.).

AN OAK LEAF ROLLER (*Croesia semipurpurana*) - VIRGINIA - Some 5,000 acres of scarlet oak trees on the James River District of the George Washington National Forest were infested during 1966. Recently completed egg surveys indicate that extensive damage may occur in 1967. (South. For. Pest Rptr., Feb. Sum.).

A WHITEFLY (*Aleuroplatus gelatinosus*) - CALIFORNIA - Nymphs heavy on oak trees at Fresno, Fresno County. (Cal. Coop. Rpt.).

MAN AND ANIMALS

COMMON CATTLE GRUB (*Hypoderma lineatum*) - OKLAHOMA - Counts per head averaged 5-8 on yearlings and cows in Payne and Noble Counties, 2-8 on cows in Dewey County, 1-12 on 30 percent of cows in Marshall County. Light to moderate in Mayes and Cleveland Counties. Adults active in Cotton, Tillman and Pushmataha Counties. (Okla. Coop. Sur.). KANSAS - Counts per head on steers ranged 0-4 in Saline County and 0-12 in Montgomery County. *H. lineatum* and *H. bovis* (northern cattle grub) reported moderate to heavy on many animals at packing plants in central district. (Simpson, Redding).

STABLE FLY (*Stomoxys calcitrans*) - MISSISSIPPI - Approximately 4-5 flies observed on several beef bulls penned near stables in Oktibbeha County. (Dinkins).

SCREW-WORM (*Cochliomyia hominivorax*) - No cases reported in U. S. February 26-March 4. Total of 35 cases reported in portion of Barrier Zone in Republic of Mexico February 19-25 as follows: Territorio sur de Baja California 4, Chihuahua 5, Nuevo Leon 1, Tamulipas 1, Sonora 24. No cases reported from Mexico south of Barrier Zone. Barrier Zone is area where eradication operations are underway to prevent establishment of self-sustaining population in U. S. Sterile screw-worm flies released: Texas 18,368,000, Mexico 90,452,000. (Anim. Health Div.).

EAR TICK (Otobius megnini) - TEXAS - Moderate in ears of horses near Waco, McLennan County. Only 2 other species, Gulf Coast tick (Amblyomma maculatum) and tropical horse tick (Anocenter nitens), normally occur in ears of domestic animals in State. (Price).

WINTER TICK (Dermacentor albipictus) - OKLAHOMA - Continues heavy on cattle and horses in Mayes and Haskell Counties. Heavy on cows in Dewey County. (Okla. Coop. Sur.).

TROPICAL RAT MITE (Ornithonyssus bacoti) - TEXAS - Moderate populations noted in homes at Mason, Mason County, and at Vernon, Wilbarger County. (Garrett, Boring).

BENEFICIAL INSECTS

CONVERGENT LADY BEETLE (Hippodamia convergens) - OKLAHOMA - Adults becoming active in wheat and alfalfa in southern half of State. (Okla. Coop. Rpt.).

DAMSEL BUGS (Nabis spp.) - ARKANSAS - Low but active in green vegetation in northwest area. (Ark. Ins. Sur.).

FEDERAL&STATE PLANT PROTECTION PROGRAMS

GRASSHOPPERS - OKLAHOMA - Stops made only where 7 or more adults per square yard were found in late summer survey. Egg pod counts averaged as follows: Latimer County, 0.25 at 3 stops; Pittsburg County, 1.5 at 5 stops; Grady and Kiowa Counties, 0.75 at 6 stops; Muskogee County negative at 2 stops. (Okla. Coop. Sur.)

ORIENTAL WOOD BORER (Heterobostrychus aequalis) - FLORIDA - Larvae and adults taken out of white oak lumber at a lumber sales yard in Miami, Dade County, February 23, 1967. This is the first established record for Dade County. (Swanson, Snowden). DELAWARE - This species and a powder-post beetle (Minthea reticulata) were collected from wooden packing case at Newark, New Castle County, in December 1966 by D. MacCreary. Det. by T. J. Spilman. Wooden case came from Vietnam. (Burbutis).

CARIBBEAN FRUIT FLY (Anastrepha suspensa) - FLORIDA - Adult collections in 8 southern counties averaged 437 per week during January and 569 during February. During last week of February, total of 740 flies collected, the highest for any week this year. Adults reared from Governors plum and Barbados-cherry. Larvae also collected in loquats, calamondins, kumquats and guavas. Some tangelos and tangerines found infested in Broward County. (Fla. Coop. Sur.).

INSECT DETECTION

New State Record

A PLUME MOTH (*Platyptilia pica*) - INDIANA - Larvae and pupae collected from geranium cuttings in Putnam County. (p. 153).

New County Records

AN ARMORED SCALE (*Comstockiella sabalis*) - FLORIDA - Collected on cabbage palm at Cross City, Dixie County. (p. 154).

AN ARMORED SCALE (*Phenacaspis heterophyllae*) - FLORIDA - Collected on loblolly pine at Melrose, Putnam County. (p. 154).

CORRECTIONS

CEIR 17(8):115 - AN OLETHREUTID MOTH (Cactra verutana chrysea) should read Bactra verutana chrysea).

CEIR 17(8):119 - Beneficial Insects - Line 4....a TORTRICID MOTH (Aptoforma... should read Apotoforma...

CEIR 17(8):126 - third paragraph, lines 5-9 - Delete reference to six-spotted leafhopper in Indiana. This note should refer to SPOTTED ALFALFA APHID (*Therioaphis maculata*) which was reported for the first time in 11 counties in Indiana during 1966.

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville, 3/2, BL - Granulate cutworm (*Feltia subterranea*) 1, armyworm (*Pseudaletia unipuncta*) 3. Sanford, 2/21-22, BL - Black cutworm (*Agrotis ipsilon*) 2, granulate cutworm 6, yellow-striped armyworm (*Prodenia ornithogalli*) 4, corn earworm (*Heliothis zea*)1. SOUTH CAROLINA - Charleston, 2/20-26, BL, temp. 17-70°, precip. 0.02 - Granulate cutworm 2. TEXAS - Brownsville - 2/18-24, 2BL, temp. 43-79° Black cutworm 10, granulate cutworm 111, tobacco budworm (*Heliothis virescens*) 1, corn earworm 6, yellow-striped armyworm 66, armyworm 21, beet armyworm (*Spodoptera exigua*) 1, cabbage looper (*Trichoplusia ni*) 5.

WEATHER OF THE WEEK ENDING MARCH 6, 1967

HIGHLIGHTS: Warmer most areas with spring storms from gulf coast to New England. Critical drought conditions in southern Great Plains.

PRECIPITATION: The week began with light to moderate precipitation over New Mexico, Oklahoma, Texas, and the eastern half of the United States except Florida. Freezing rain from the Great Lakes and Ohio River Valley regions to New England slicked the highways and made driving hazardous. Light precipitation fell in the Far Northwest and eastward to the western edge of the Great Plains. Little precipitation occurred elsewhere in the United States during the first several days of the week. The drought intensified over the Southwest and southern Great Plains, where strong winds raised clouds of dust and farmers worried about losing valuable topsoil. Weekend precipitation was light but widespread. Snow fell in the Rockies, the Great Lakes region, and eastward to New England. An inch of snow fell as far south as Zuni, New Mexico, and Flagstaff, Arizona, received 2 inches of snow Saturday, the first measurable precipitation since January 25. On Sunday, violent

Weather continued on page 158.

HAWAII INSECT REPORT

Vegetables - All stages of PEPPER WEEVIL (*Anthonomus eugenii*) light and affecting fruit set in 0.5 acre of bell pepper at Kahuku, Oahu. (Sato). GREENHOUSE WHITEFLY (*Trialeurodes vaporariorum*) moderate on 0.25 acre of potatoes; heavy on small plantings of eggplant and zucchini in Kahului, Maui. CARMINE SPIDER MITE (*Tetranychus telarius*) moderate on eggplants in above field. (Miyahira).

Sugarcane - SUGARCANE LEAF ROLLER (*Hedylepta accepta*) moderate on small ornamental planting of Hawaiian sugarcane at Makawao, Maui. (Miyahira).

Shade Trees - CUBAN-LAUREL THRIPS (*Gynaikothrips ficorum*) light and widespread on Chinese banyans in Ala Moana Park, Oahu. Infestation effectively held in check by an introduced anthocorid bug, *Montandoniola moraguesi*. (Morris).

Ornamentals - BLACK TWIG BORER (*Xylosandrus compactus*) light to moderate on *Epicattleya* spp. and *Dendrobium* spp. at nursery in Hilo. This is the first record on orchids for Hawaii Island. (Yamayoshi). GREEN SCALE (*Coccus viridis*) heavy on gardenia at Kaneohe, Oahu; light on plumeria at Kahuku. Both immature and adult stages present. (Kajiwara).

General Pests - All stages of a PLATASPID BUG (*Coptosoma xanthogramma*) heavy and completely covered branches of pigeon pea at Pearl Harbor, Oahu; eggs on all parts of plant. Surveys conducted in Waianae Valley, Oahu, for a GRASSHOPPER (*Schistocerca vaga*) revealed a buildup, mostly adults, on weeds and grasses. On Kauai, a female was collected on sugarcane in Koloa. Six females have been collected since the grasshopper was first reported from Kauai in July 1966. (Au, et al.). SOUTHERN GREEN STINK BUG (*Nezara viridula*) activity increased throughout State. Light, scattered populations, mostly nymphs, confined largely to wild hosts. (Nakao).

Household - PACIFIC BEETLE COCKROACH (*Diploptera punctata*) adults moderate around housing area at Pearl Harbor, Oahu; annoying, especially after heavy rains. (Kajiwara).

Beneficial Insects - A NOCTUID MOTH (*Hypena strigata*) - on Maui, over 20 square miles of lantana in the Ulupalakua and Auahi area was denuded by larvae of this introduced insect. Increased activity also noted on Lanai Island. (Miyahira, Davis). AN ICHNEUMONID WASP (*Ecthromorpha fuscator*) was reared from chrysalids of monarch butterfly (*Danaus plexippus*) collected in Manoa Valley, Oahu. This is a new host record for this native wasp. (Hale, Huddleston).

Weather continued from page 157.

thunderstorms occurred in parts of Arkansas with a few reports of personal injuries and property damage. Sleet and freezing rain fell south of the snow areas from Missouri to New England, with rain or drizzle farther south. Late Monday, March 6, tornadoes ripped across Mississippi and Alabama, killing at least 1 person, injuring many and causing property damage to more than a dozen communities. On the same day heavy snow spread northeastward from the Ozarks to New England. South of the snow belt, heavy rains, 1 to 3 inches, sent rivers on the rise.

TEMPERATURE: Cold temperatures persisted near the Great Lakes and over the Northeast but mild Pacific air warmed the Western States and eastern slopes of the Rockies. Southerly winds brought warm air to mid-America and to the Southeast as far north as Kentucky and Virginia. Temperatures climbed into the 70's in central Nebraska on several days at midweek, and in Virginia over the weekend. A new mass of Arctic air with subzero temperatures and strong north winds began moving into the northern Great Plains. (Summary supplied by Environmental Data Service, ESSA).

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1966

(continued from page 148)

FORAGE LEGUMES

Highlights:

ALFALFA WEEVIL was again the most important pest of alfalfa in the Nation as it has been for three years. It was found for the first time in Michigan and Wisconsin. Its range was extended into 128 counties in 12 States. Damage ranged light to heavy in many areas, especially to first and second cuttings. CLOVER LEAF WEEVIL was a problem in Vermont, Texas, Kansas and Washington. ALFALFA CATERPILLAR, GREEN CLOVERWORM and VARIEGATED CUTWORM were reported from several States, causing damage in some. PEA APHID caused some damage in Arkansas, Oklahoma and Kansas; however, populations were light in other States reporting. PLANT BUGS were generally normal during 1966.

ALFALFA WEEVIL (*Hypera postica*) was the most important pest of alfalfa again in VIRGINIA and caused considerable concern to first and second cuttings. Larvae were active during the first week of March in Prince Edward, Culpeper, Hanover and Charles City Counties. Larvae reached a peak during May and caused moderate to heavy damage to unprotected and poorly sprayed alfalfa in all sections of MARYLAND. During June and July, larvae and first-generation adults caused conspicious injury to second-growth alfalfa in Carroll, Frederick and Howard Counties. In DELAWARE, alfalfa weevil was generally high with heaviest injury to alfalfa during late May. Populations during 1966 in NEW JERSEY were moderate to severe with little change from 1965. Alfalfa weevil developed 2 weeks late in CONNECTICUT due to cool spring temperatures and caused heavy damage to second cutting, especially in Litchfield and Fairfield Counties. Distribution was statewide in RHODE ISLAND. Oviposition peaked during late May, and larvae reached 2,144 per 50 sweeps during mid-June in the Kingston area. Damage was noticeable in NEW HAMPSHIRE for the first time. In VERMONT, damage was the worst ever experienced. Adults averaged 4-5 per sweep and larvae 40-50 per sweep during early June. Alfalfa weevil increased in intensity west of the Allegheny Mountains in PENNSYLVANIA, but decreased somewhat in the southeast. Spring planted alfalfa was severely damaged in several parts of the State.

Alfalfa weevil infested all counties in OHIO not reported infested during previous seasons. Severe damage occurred in the southeastern half of the State, with very little of the first cutting harvested without the use of controls. Heavily infested fields had up to 100 larvae per sweep. Many farmers used substitute hay crops. Alfalfa weevil was found for the first time in MICHIGAN May 21 in Livingston County and was collected in 5 additional counties later in year. Distribution increased by 30 new counties in INDIANA this year; economic infestations occurred generally throughout the southern quarter of the State. Approximately 30,725 acres were treated in 26 southern counties. *H. postica* continued its rapid spread northward in ILLINOIS and increased its range from 47 counties infested in 1965 to 83 counties in 1966. At least 75 percent of first-cutting alfalfa was destroyed in the southern 2 tiers of counties. Approximately 10,372 acres were treated in the southern area. Alfalfa weevil was detected in WISCONSIN for the first time, being collected in Kenosha County November 15. Approximately 460 alfalfa fields were surveyed in Kenosha, Racine, Walworth and Rock Counties, but only one field was found infested. Larvae were first reported in Pemiscot County, MISSOURI, March 2. Heavy damage was confined to early infested southeastern counties. Alfalfa weevil was found in 20 additional Missouri counties this year. Alfalfa weevil was found in 6 new counties in ARKANSAS, extending its movement westward across the northern section and southward across the eastern section.

Alfalfa weevil adults were active on alfalfa in NORTH DAKOTA in early June. Highest populations were present in flood-irrigated fields. Light to moderate damage was evident in the more heavily infested fields. New county records were Dunn, Divide, Billings, Hettinger, Mercer, McKenzie, Williams and McLean. Populations were high in the Black Hills area of SOUTH DAKOTA. Larvae reached a high of 3,440 per 100 sweeps in uncut alfalfa during late June; however, little damage occurred. In KANSAS, alfalfa weevil was collected in Scott and Haskell Counties for the first time. A total of 8 western counties are not infested; however, populations remained low and noneconomic. Populations were lighter than in 1965 in NEBRASKA. The weevil was found in Gosper County in mid-May for a new record. Larval populations decreased in midsummer and were less prevalent than in 1965 in COLORADO. Damage again exceeded that of any other crop in WYOMING; however, economic damage to alfalfa was slightly lower than in 1965. Larval counts reached a peak during the first hay harvest. Peak counts of 430-1,000 per 10 sweeps near mid-June were observed in the Big Horn Basin. Very little damage occurred in southeastern Wyoming where light populations were found. Spraying of stubble and standing alfalfa did not produce satisfactory results. Alfalfa weevil was serious in most areas of MONTANA; losses ranged from 5 percent to more than 40 percent. Losses exceeding one million dollars were reported in Carbon County while many other losses approaching this figure were also reported in Montana. First adult activity of the season was noted March 17 at Parma and March 29 at Idaho Falls, IDAHO. Larvae varied from a few to 100 per sweep in first-crop alfalfa; terminal damage approached 100 percent in several areas. Damage exceeded 12 million dollars during the year. This was more than a one-million dollar increase, compared with 1965. Adults were collected for first time in Bonner County.

Alfalfa weevil was slightly more serious than in 1965 in OREGON and seriously damaged untreated alfalfa in Wallowa, Baker, Lake, Klamath and Malheur Counties. Damage to first and second-crop alfalfa was extensive and severe in UTAH. Several areas were sprayed. Damage to second crop was more severe than normal. Infestations and damage were the heaviest in recent years in NEVADA; cold weather retarded alfalfa growth and egg hatch was spread over a longer period. In some areas, larval counts reached 400 per sweep. Larval populations peaked May 20 in southern counties, June 10-15 in central counties and July 20-25 in northern counties. Alfalfa weevil increased its range and damage in CALIFORNIA and now occurs from Fresno County northward. Damage was light to heavy on first and second cuttings of alfalfa in San Juan, Rio Arriba, Sandoval and Bernalillo Counties, NEW MEXICO. For alfalfa situation in U. S., see CEIR 17(2):19.

EGYPTIAN ALFALFA WEEVIL (Hypera brunneipennis) caused moderate to heavy damage to alfalfa in Yuma and Maricopa Counties and parts of Pinal County, ARIZONA. Populations were much higher in Maricopa County than any previous year. Populations peaked in February and continued until late April. Parasites were not as effective as in previous years.

CLOVER LEAF WEEVIL (Hypera punctata) was unusually abundant and damaging on alfalfa in the Columbia Basin of WASHINGTON during the spring. Clover leaf weevil is a new insect in TEXAS and the most destructive pest of crimson clover. Infestations have been recorded in Upshur, Houston, San Augustine, Tyler, Jasper, Nacogdoches and Rusk Counties. The range of this pest in eastern Texas is increasing rapidly. Larvae damaged alfalfa in scattered areas of OKLAHOMA from January through April. Light infestations appeared in the northeast area during late December. Clover leaf weevil infestations were higher than usual in few areas of west-central KANSAS and caused some damage to second-cutting alfalfa. In ILLINOIS, larval populations were about the same as the 10-year (1955-1964) average. Population ranged up to 35 per square foot with approximately 3,101 acres treated. However, 30 percent of larvae in east-southeast district were parasitized, probably by Biolysia tristis (an ichneumon wasp), in April. No parasitized larvae were found in the eastern district and only 4 percent in the southwestern district. Larvae were active from mid-April through most of May in OHIO. Generally, populations appeared to be below economic levels in most fields. Clover leaf weevil caused heavy damage to trefoil seed production in VERMONT. LESSER CLOVER LEAF WEEVIL

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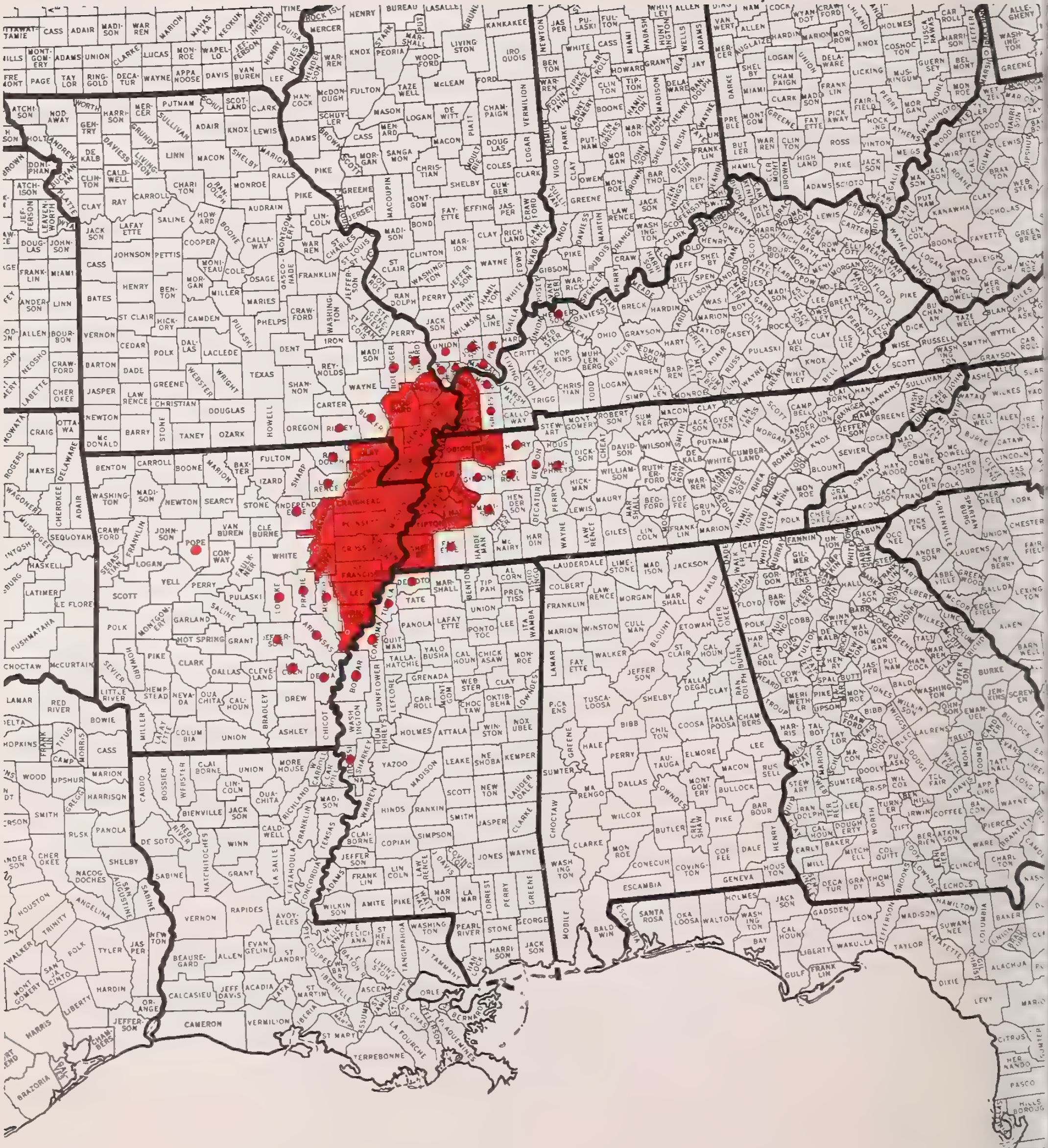

ATODE QUARANTINE

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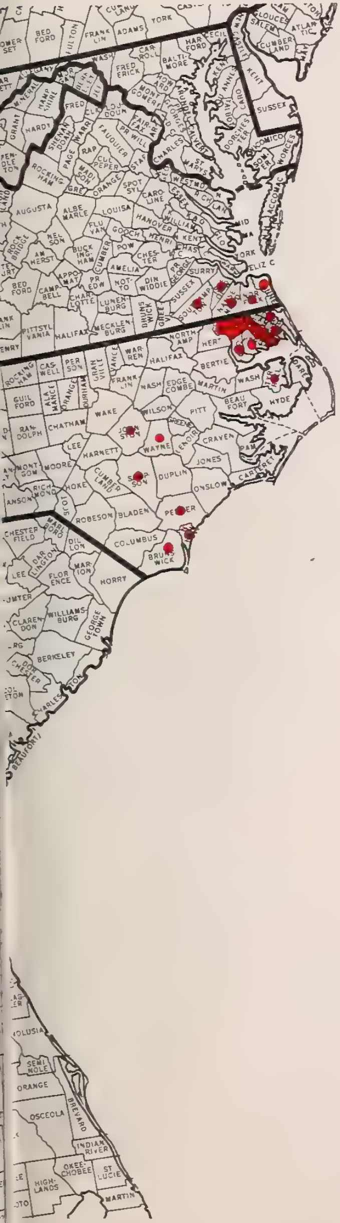
AFFECTED STATES



CONSULT YOUR STATE OR FEDERAL PLANT PEST CONTROL INSPECTOR OR YOUR COUNTY AGENT FOR ASSISTANCE REGARDING EXACT AREAS UNDER REGULATION AND REQUIREMENTS FOR MOVING REGULATED ARTICLES.

Counties entirely colored are completely regulated; counties partially colored are partially regulated.

Restrictions are imposed on movement of regulated articles from red into or through white.

THE FOLLOWING CROPS OR ARTICLES MUST BE MOVED UNDER CERTIFICATE OR LIMITED PERMIT YEAR-ROUND EXCEPT AS NOTED:

1. Soil, except soil samples to Corps of Engineer Laboratories are exempt.
2. Nursery stock and other plants with roots attached.
3. True bulbs, corms, rhizomes, and tubers, except true bulbs and corms which have been stored a minimum of 90 days and are free of soil are exempt.*
4. Root Crops, except root crops such as beets, carrots, Irish potatoes, onions, radishes, rutabagas, sweet potatoes, and turnips if moving to a designated processing plant** or if free of soil are exempt.*
5. Sugar beets.
6. Soybeans and small grains for planting, except soybeans and small grains other than for planting and earcorn if harvested in bulk or directly into new or treated containers and the containers or crops did not come in contact with the soil are exempt.*
7. Hay, straw, fodder, and plant litter of any kind.
8. Seed cotton and peanuts, except seed cotton and peanuts moving to a designated gin or plant** are exempt.*
9. Used farm tools, implements, and harvesting machinery, and used construction and maintenance equipment, except used farm tools and implements if cleaned free of soil are exempt.*
10. Used crates, boxes, burlap bags, cotton picking sacks, and other used farm products containers, except cotton picking sacks are exempt if cleaned or treated to the satisfaction of an inspector.*

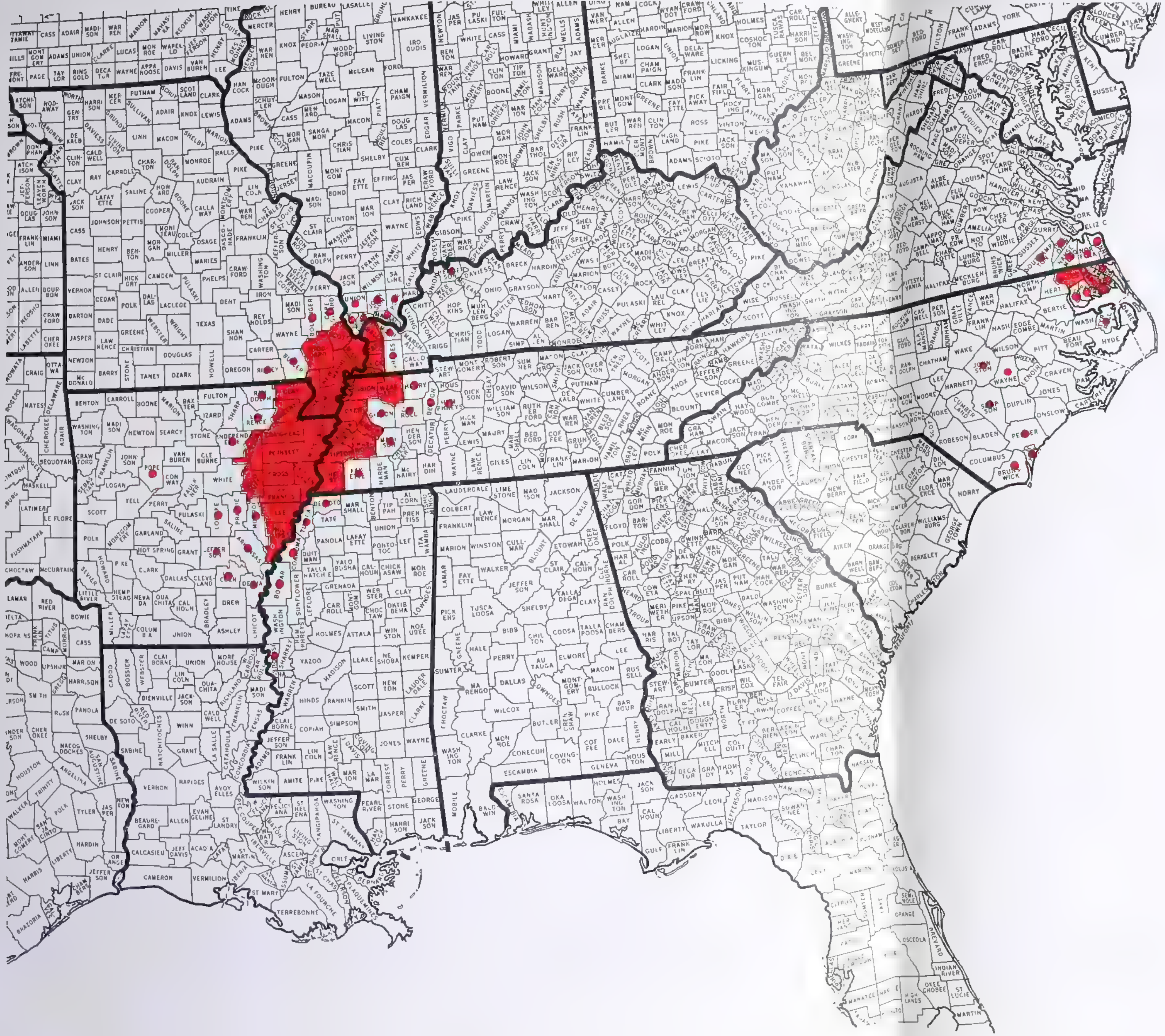
*Exempt if not exposed to infestation or if sanitation practices are maintained as prescribed by or to the satisfaction of the inspector.

**Information as to designated processing plants and gins may be obtained from an inspector.

Revised January 1, 1967

SOYBEAN CYST NEMATODE QUARANTINE

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE - PLANT PEST CONTROL DIVISION
COOPERATING WITH AFFECTED STATES



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(Hypera nigrirostris) larvae infested up to 100 percent of clover stems in many southern ILLINOIS fields.

SWEETCLOVER WEEVIL (Sitona cylindricollis) severely damaged seedling sweetclover in northwest MINNESOTA. Populations were light in most sweetclover fields throughout NORTH DAKOTA. High adult populations in the southeast caused light defoliation of sweetclover.

A moderate population of PEA WEEVIL (Bruchus pisorum) was detected in a field of alfalfa during late August in Cochise County, ARIZONA. This constituted a new host record.

ASH-GRAY BLISTER BEETLE (Epicauta fabricii) adults appeared on alfalfa in early June in NORTH DAKOTA, but remained noneconomic throughout season, while BLACK BLISTER BEETLE (E. pennsylvanica) was moderate in a few scattered fields of alfalfa. Black blister beetle remained low throughout the summer and caused no problems in KANSAS. Epicauta spp. were present in clover and alfalfa in ILLINOIS, but caused no damage.

PALE-STRIPED FLEA BEETLE (Systena blanda) caused economic damage to alfalfa in SOUTH DAKOTA during 1966. Populations ranged up to 150-200 adults per 100 sweeps in Tripp and Meade Counties.

SOUTHERN CORN ROOTWORM (Diabrotica undecimpunctata howardi) was evident in trace numbers in some NORTH DAKOTA alfalfa fields. Infestations were recorded for the first time in Adams, Golden Valley, Oliver, Richland, Ransom, Sargent and Dickey Counties. Minor feeding was evident on alfalfa in OHIO.

ALFALFA CATERPILLAR (Colias eurytheme) required treatment in most alfalfa in CALIFORNIA from July to October. Infestations were below the 1964-65 level in Clark County, NEVADA, but caused considerable damage to late alfalfa. Alfalfa caterpillar was common in alfalfa throughout NEW MEXICO, but caused only minor damage. Larvae appeared as early as January 27 in ARKANSAS; however, infestations were noneconomic this season. Larvae averaged 53 per 100 sweeps in northwest ILLINOIS July 11-14, but no damage occurred. Alfalfa caterpillar was light in eastern KANSAS and no damage was noted. Larvae ranged 40-65 per 100 sweeps on alfalfa in SOUTH DAKOTA, particularly in Sanborn County and in north-central and east-central areas during September. Heavy populations appeared in alfalfa late in season in NORTH DAKOTA.

GREEN CLOVERWORM (Plathypena scabra) was present in OKLAHOMA from April to October. Populations were moderate to heavy throughout MISSOURI, but damage was light. Some controls were applied in the southeast area. Larvae averaged 10-15 per 100 sweeps in clover and alfalfa throughout ILLINOIS in late May and early June and 18 per 100 sweeps in the northwest district during August. No damage was observed, however. Second to fourth-stage green cloverworm larvae were prevalent on alfalfa in Yankton and Butte Counties, SOUTH DAKOTA, in early May.

VARIEGATED CUTWORM (Peridroma saucia) larvae averaged 22 per 100 sweeps or up to 2 per square foot on clover and alfalfa in southern ILLINOIS during May. Adults were first collected at Portageville, MISSOURI, April 6. Larvae damaged alfalfa and soybeans in the southeast area and new growth of alfalfa was severely injured in central and west-central areas. Variegated cutworm was light on alfalfa in a few northeast area fields in KANSAS and no damage was reported. Variegated cutworm and GRANULATE CUTWORM (Feltia subterranea) caused heavy damage to alfalfa in Yuma, Maricopa and Pinal Counties, ARIZONA, during April and May. Losses to alfalfa were severe. Variegated cutworm larvae were unusually abundant early in the season on forage in CALIFORNIA.

GLASSY CUTWORM (Crymodes devastator) damaged new growth of second-cutting alfalfa in central PENNSYLVANIA. SPOTTED CUTWORM (Amathes c-nigrum) caused only minor feeding damage to alfalfa in OHIO. In OKLAHOMA, YELLOW-STRIPED ARMYWORM (Prodenia ornithogalli) was widespread but light on alfalfa from April through October and

FALL ARMYWORM (Spodoptera frugiperda) was moderate in most areas from July to October. WESTERN YELLOW-STRIPED ARMYWORM (Prodenia praefica) infested alfalfa in a few counties in northern CALIFORNIA. Unspecified CUTWORMS were the major pests on forage statewide in California. Larvae of another cutworm, Heliothis phloxiphaga, were heavy on seed alfalfa in northern Washoe County, NEVADA, in mid-July. GARDEN WEBWORM (Loxostege similalis) was heavier than normal in ARKANSAS and remained in fields later in the season than usual. Garden webworm and ALFALFA WEBWORM (L. commixtalis) occurred mainly in west-central ILLINOIS alfalfa and caused some webbing and damage. An estimated 12,017 acres were treated. Garden webworm larvae damaged alfalfa and soybeans in southeastern MISSOURI and in the entire western half of the State. Alfalfa webworm was light in a few scattered fields in central KANSAS; however, garden webworm adults were extremely numerous in many alfalfa fields in eastern two-thirds of Kansas with considerable acreage treated. Garden webworm was heavy on alfalfa in parts of southeastern NEBRASKA in August.

PEA APHID (Acyrthosiphon pisum) was severe on alfalfa in early spring in the Columbia Basin of WASHINGTON, and on seed alfalfa in Walla Walla and Franklin Counties during midsummer. Considerable control by parasites and predators was evident in several areas. Pea aphid was noneconomic on alfalfa in southern IDAHO. Infestations were heavy and required controls in many areas of NEVADA. Predators and parasites controlled many infestations. Pea aphid caused light to moderate damage during September in Pinal and Pima Counties, ARIZONA, and minor damage to alfalfa throughout NEW MEXICO. Noneconomic, light to moderate pea aphid populations were recorded on several legumes, principally vetch and alfalfa, throughout north and central TEXAS. Populations ranged 300-400 per 100 sweeps on alfalfa during May in ARKANSAS. Pea aphid was present in OKLAHOMA through March. Numbers increased rapidly in most areas during April and ranged as high as 1,000 per 10 sweeps in some areas on alfalfa and Austrian winter field peas. Decreases began in May and infestations were light, except in isolated areas in east-central counties, until aphids disappeared in mid-July. Fall activity in Oklahoma began in mid-September with light numbers present through November. Isolated heavy counts were present in the northeast area in late December. Pea aphid caused considerable damage to alfalfa prior to first cutting in central KANSAS, although predators and parasites kept numbers below economic levels elsewhere. Populations were low the remainder of season. Pea aphid did not increase to high levels on alfalfa in COLORADO and remained low on this crop throughout NEBRASKA. Pea aphid first appeared in alfalfa in southeastern WYOMING in late April and in early May in northern areas. Populations remained low throughout the growing season, counts ranging 50-85 per 10 sweeps in all areas. Populations increased to 225-250 per 10 sweeps with the advent of cooler weather in late September, then declined in October.

Pea aphid was the most common and prevalent aphid on alfalfa in SOUTH DAKOTA, particularly during the cooler weather of spring and fall. Populations were noneconomic throughout the season in NORTH DAKOTA, but were high on alfalfa throughout growing season in MINNESOTA despite high numbers of aphid predators. Pea aphid eggs hatched the first week of May in alfalfa fields in southern WISCONSIN. Winged forms were noted on peas in mid-May. Populations in alfalfa were high until mid-July when parasites began exerting control. Numbers were very low throughout season in ILLINOIS. The highest population was 160 per sweep. Parasites were present in most fields. Only 293 acres of alfalfa were estimated to have been treated this year. Pea aphid was light on alfalfa and clover in the southern third of INDIANA throughout the growing season. In the northern half of the State, counts ranged 10-78 per sweep during June before a heat wave caused pea aphid populations to collapse. Adult and nymphal populations in MICHIGAN fluctuated according to alfalfa growing conditions, predator numbers, and other factors, but population levels during 1966 were generally lower than usual. Damsel bugs were important as predators in Michigan. Pea aphid was present on alfalfa throughout VIRGINIA but caused little damage. Populations were light to moderate throughout NEW JERSEY and few fields required controls. Pea aphid was less abundant on alfalfa in RHODE ISLAND than last year. Buildup was slow, probably due to cold spring weather.

COWPEA APHID (Aphis medicaginis) was heavy in isolated alfalfa in north-central, northwest and panhandle areas of OKLAHOMA during late April and early May.

THRIPS were heavy in alfalfa in west-central and northwest KANSAS, with over 1,000 per 5 sweeps. Thrips were also heavy on alfalfa in Clark County, NEVADA, in April, causing leaf and bud damage.

ALFALFA SEED CHALCID (Bruchophagus roddi) damage to alfalfa seed was heavier than in previous years in Humboldt and Lander Counties, NEVADA. Infestations in alfalfa decreased slightly in WASHINGTON compared with 1965. A survey of 10 fields showed seed infestations ranged 2-42 percent. The average was 11 percent compared with 16 percent in 1965. Also in Washington, CLOVER SEED CHALCID (B. platyptera) infested up to 35 percent of red clover seed at Columbia Basin localities.

RAPID PLANT BUG (Adelphocoris rapidus) and ALFALFA PLANT BUG (A. lineolatus) were serious on alfalfa in OHIO; counts averaged 1 per sweep. Adults and nymphs of TARNISHED PLANT BUG (Lygus lineolaris) were more numerous than during recent years and were the dominant plant bug species on alfalfa in MICHIGAN. Rapid plant bug nymphs ranged 20-200 per 100 sweeps on alfalfa in south-central INDIANA during May. Tarnished plant bug was more abundant during 1966 than in 1965. All stages ranged 100-700 per 100 sweeps on clover and alfalfa throughout the State during July and August. Alfalfa plant bug reached peaks in the southern half of the State during mid-June, when all stages also ranged 100-700 per 100 sweeps on alfalfa. In the northern half of INDIANA, heaviest populations occurred during mid-July and all stages ranged from 100 to 1,600 per 100 sweeps, higher densities being found in the northern third of the State. Adults and nymphs were low throughout the season in ILLINOIS. Adults of tarnished plant bug and newly hatched nymphs of rapid plant bug were observed in alfalfa the first week of May. Two weeks later, rapid plant bug nymphs were noted. Populations throughout Illinois were fairly high from June to mid-August. No apparent damage to alfalfa was attributed to these pests. Tarnished plant bug adults and nymphs were generally low with highest field counts averaging only 220 adults per 100 sweeps. Alfalfa plant bug nymphs were first observed May 9. The highest field population in Illinois, 3.6 nymphs per sweep, was found in the central district June 6-9.

Tarnished plant bug was light to moderate in alfalfa from early April to mid-November in OKLAHOMA. LYGUS BUGS (Lygus spp.) were moderate, 15-20 per 10 sweeps, in northeast KANSAS during June and July. Elsewhere, numbers remained very low and these bugs remained noneconomic throughout the season. Tarnished plant bug ranged 100-125 per 10 sweeps on alfalfa in eastern NEBRASKA during late summer, but were lighter in the remainder of the State. Nymphs of alfalfa plant bug ranged 120-200 per 100 sweeps in alfalfa in various areas of SOUTH DAKOTA including Lawrence and Day Counties, but remained low throughout the season in NORTH DAKOTA. Lygus bugs occurred on alfalfa in destructive numbers in MONTANA. Nymphs and adults of Lygus elisus and L. hesperus ranged 7-15 per sweep in alfalfa in Canyon, Elmore and Owyhee Counties, IDAHO, on May 27; however, summer numbers were about the same as in other years. Lygus bugs were a problem in alfalfa seed production fields in western COLORADO. Populations were up slightly over 1965 in NEVADA, especially in alfalfa seed fields and required control in all seed areas during the summer. Controls were applied too late and heavy damage occurred in some areas of Nevada. Lygus bugs were widespread and damaging throughout CALIFORNIA on forage.

Lygus bug adults and nymphs were very prevalent in blooming alfalfa and clover fields throughout MARYLAND. Tarnished plant bug was generally normal to heavy on forage in RHODE ISLAND, and damaged trefoil and alfalfa in VERMONT.

FALSE CHINCH BUG (Nysius ericae) was general throughout south-central and southwestern IDAHO; adults and nymphs averaged 10 per sweep on alfalfa June 3.

MEADOW SPITTLEBUG (*Philaenus spumarius*) was common but less conspicuous than usual on forage throughout RHODE ISLAND. Nymphal populations were the highest in several years on red clover and hay mixtures in eastern and central sections of MARYLAND. Nymphs ranged up to 4 per 10 stems on alfalfa and clover in south-central and southeastern INDIANA during May. Adults were common in these same areas during mid-June, ranging up to 12 per sweep on alfalfa and up to 70 per sweep in a few adjacent wheat fields. In general, populations were moderate during 1966, and were slightly lower than in 1965. Populations were low in most areas of ILLINOIS with an estimated 220 acres treated in the northwest district. Meadow spittlebug eggs began hatching the second week of May. Spittle masses were common in alfalfa, but populations were not high. Adults appeared about June 17 in southern counties and about July 1 in northern counties. Adults were present into late fall. Nymphs were unusually heavy in alfalfa during May in Douglas County, OREGON. See distribution map page 165.

THREE-CORNERED ALFALFA HOPPER (*Spissistilus festinus*) was moderate to heavy and caused extensive damage to alfalfa in nearly all areas of ARIZONA during the summer months. Extremely heavy damage occurred in Maricopa and Pinal Counties during October and early November. Populations were light to moderate on alfalfa from early May to early November in OKLAHOMA. Unspecified LEAFHOPPERS were a problem on new alfalfa throughout MONTANA. BUFFALO TREEHOPPER (*Stictocephala bubalus*) was more abundant on legumes than in past years in VERMONT.

Populations of FIELD CRICKETS (*Gryllus* spp.) were high along roadsides and some fields of alfalfa in northwest MINNESOTA. Crop damage was noneconomic to light and generally restricted to field margins. Populations were light throughout the season in NORTH DAKOTA.

SOYBEANS

Highlights:

VELVETBEAN CATERPILLAR and CABBAGE LOOPER damaged soybeans in Alabama and Florida. Approximately 81,433 acres were treated for control of GREEN CLOVERWORM in Illinois. GARDEN WEBWORM was more widespread in Arkansas than in recent years. MEXICAN BEAN BEETLE caused economic damage in Florida and Virginia. SOUTHERN GREEN STINK BUG was less of a problem during 1966. STRAWBERRY SPIDER MITE damage was very conspicuous in Maryland and Delaware.

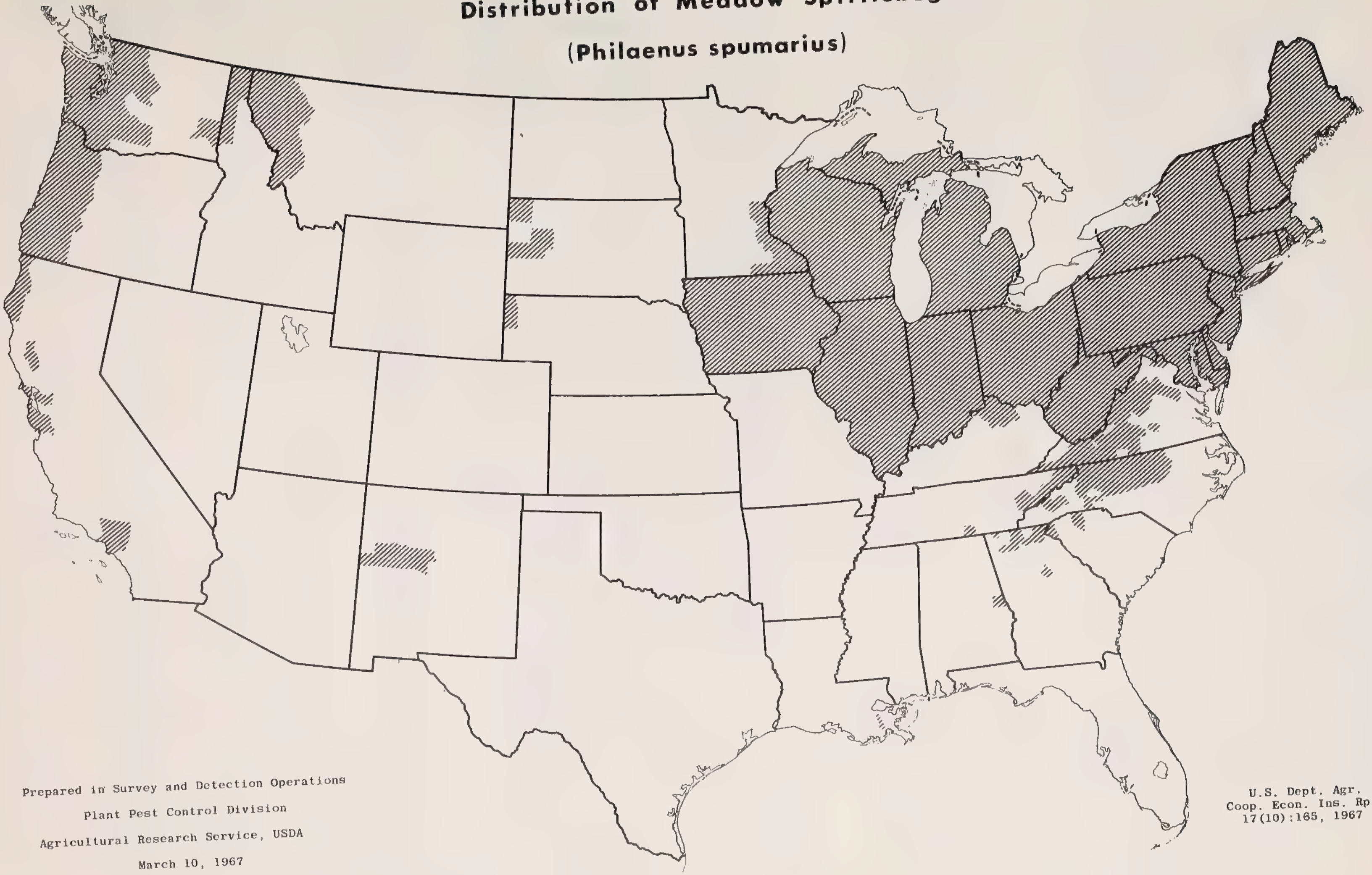
VELVETBEAN CATERPILLAR (*Anticarsia gemmatalis*) was a serious pest of soybeans in isolated fields in the coastal area of ALABAMA, with heavier numbers in extreme southwest section. Of the noctuid loopers, this pest was a secondary problem in north FLORIDA. Frequent control measures and later in the season a fungus, probably *Spicaria rileyi*, helped to control larvae in many years.

CABBAGE LOOPER (*Trichoplusia ni*) was another secondary pest in north FLORIDA. Larvae were held in check by frequent control measures and a fungus, probably *Spicaria rileyi*, late in the season. Cabbage looper also damaged some soybeans in the coastal counties of ALABAMA. Since virus and fungus heavily infected cabbage looper in ARKANSAS, larvae did not become an economic problem. No extensive damage was observed in KANSAS, although a few scattered fields in the southeast area were lightly infested.

GREEN CLOVERWORM (*Plathypena scabra*) was noted during September in OKLAHOMA and was noneconomic in ARKANSAS. The amount of damage was questionable although it ragged soybean leaves heavily in central and northern ALABAMA. Damage occurred on 6.45 percent of the fields in Henry and Bureau Counties, ILLINOIS, with no

Distribution of Meadow Spittlebug

(*Philaenus spumarius*)



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evidence of pod feeding. One larva per sweep and 6 per foot of row were found in late August; approximately 81,433 acres were treated in Illinois.

Several other NOCTUIDS damaged soybeans. YELLOW-STRIPED ARMYWORM (Prodenia ornithogalli) continued as minor problem in ARKANSAS. However, TOBACCO BUDWORM (Heliothis virescens) and CORN EARWORM (H. zea) damaged soybeans in ALABAMA. Pseudoplusia includens was the dominant noctuid looper in northern FLORIDA and throughout Alabama, with damage evident in the coastal counties of Alabama.

ALFALFA WEBWORM (Loxostege commixtalis) infested soybeans in the southwest quarter of ILLINOIS and caused light to moderate damage in some fields. Approximately 7,750 acres were treated. Heavy populations of GARDEN WEBWORM (L. similalis) moved into soybeans after alfalfa was cut in parts of southwestern NEBRASKA; some controls were applied. Garden webworm was more widespread in ARKANSAS than in past years. In OKLAHOMA, WEBWORMS (Loxostege spp.) damaged soybeans in northeast and east-central areas during July.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus) damaged young soybean plants in ALABAMA, mostly in Monroe County. BEAN LEAF ROLLER (Urbanus proteus) caused moderate to heavy damage in several large fields during September at Brooksville, FLORIDA. Millions of PAINTED LADY (Vanessa cardui) adults flew northward through Moscow, IDAHO, May 6 and 8. Larvae fed on all thistle varieties statewide by the end of June. In northeastern NEBRASKA, larvae damaged some field margins during mid-June. Painted lady larvae abounded on thistles in ILLINOIS and occasionally moved into soybeans after devouring thistles. Although reports of larval feeding were numerous from central and west-central OHIO during early July, damage was minor.

BEAN LEAF BEETLE (Cerotoma trifurcata) was light to moderate in most soybeans in KANSAS during June and July, with considerable leaf feeding evident. This pest was heavy for the first time on young beans in northeast ARKANSAS, feeding on maturing pods late in the season without economic damage. In ILLINOIS, up to 3 adults per sweep were observed. An estimated 2,891 acres were treated. In southeastern Renville County, MINNESOTA, bean leaf beetle damaged soybeans in August for the first time this late in the season. It also damaged soybeans in OHIO. Normal numbers of adults injured foliage in variable amounts on the Eastern Shore of MARYLAND. Bean leaf beetle was light in VIRGINIA.

MEXICAN BEAN BEETLE (Epilachna varivestis) was a problem during late season in the Quincy area of Gadsen County, FLORIDA. Numbers were light in all fields throughout ALABAMA, except for isolated fields in Baldwin County, where counts were heavy. Defoliation ranged light to heavy throughout VIRGINIA, ranging 70-80 percent in the southeastern area in late September.

BROWN STINK BUG (Euschistus servus) caused moderate to heavy damage in several large fields during September at Brooksville, FLORIDA. Nymphs and adults damaged soybeans after pod development in coastal areas of ALABAMA. Euschistus spp. caused light damage in southeast and southwest MISSOURI. SOUTHERN GREEN STINK BUG (Nezara viridula) was less of a problem than in past years late in the season in the Quincy area of Gadsen County, FLORIDA, although damage was moderate to heavy in several large fields during September. Nymphs and adults of this pest damaged plants after pod development in coastal areas of ALABAMA. In TEXAS, southern green stink bug damage was light. GREEN STINK BUG (Acrosternum hilare) was lighter than in 1965 in southeast KANSAS. Elevator operators reported 50 percent less damage. Green stink bug was also light in southeast and southwest MISSOURI.

SEED CORN MAGGOT (Hylemya platura) damaged soybeans in OHIO. THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) was noneconomic in most areas of ARKANSAS.

THRIPS were heavy in most areas of OKLAHOMA from mid-June to mid-July. Mainly Sericothrips variabilis was present in most soybean fields in ILLINOIS. Highest populations were 110-500 (average 305) per 100 leaflets in the central district, with 60 percent of plants showing some silvering. Thrips caused widespread streaking of foliage and stunting of seedling and young beans on the Eastern Shore of MARYLAND.

CARMINE SPIDER MITE (Tetranychus telarius) was widespread in ILLINOIS and heaviest from Mason County southward into Greene and Macoupin Counties, where 34 percent of the fields showed "russetting" during July and August. Approximately 4,132 acres were treated. SPIDER MITES were heavy in southeast VIRGINIA during late summer. STRAWBERRY SPIDER MITE (T. atlanticus) was a primary pest of soybeans in MARYLAND during the year. Damage was conspicuous on border rows during August on the lower Eastern Shore. Strawberry spider mite was generally very heavy and severely injurious throughout DELAWARE.

PEANUTS

Highlights:

BURROWING STINK BUGS caused serious damage to peanuts in Alabama.

BURROWING STINK BUGS (Tominotus communis and Pangaeus bilineatus) caused serious damage to peanuts in southeastern ALABAMA. Over 1,000 tons were downgraded in price as the result of nut damage underground during the growing season. Additional unknown yield losses also occurred. NEGRO BUG (Corimelaena pulicaria) caused losses of 3 percent during late summer in Bonifay, Holmes County, FLORIDA.

FALL ARMYWORM (Spodoptera frugiperda) was light to moderate on peanuts in most areas of OKLAHOMA from late July to October. RED-NECKED PEANUTWORM (Stegasta bosqueella) was light to moderate on peanuts from early July to mid-September and LESSER CORNSTALK BORER (Elasmopalpus lignosellus) was light on this crop during August in Bryan County, Oklahoma. VELVETBEAN CATERPILLAR (Anticarsia gemmatalis) infested peanut foliage in ALABAMA, as did unspecified CUTWORMS, CORN EARWORM (Heliothis zea) and TOBACCO BUDWORM (H. virescens). GRANULATE CUTWORM (Feltia subterranea) damaged large acreages of peanuts in Houston, Coffee, Geneva and several other counties in Alabama. Fall armyworm was of less concern than in some years, but did occur with other leaf feeders in isolated fields.

TOBACCO THRIPS (Frankliniella fusca) damaged young peanuts throughout the 9-county peanut-growing area of ALABAMA and some controls were necessary. SPIDER MITES were heavy on peanuts in southeast VIRGINIA during August and September.

Overwintering of Alfalfa Weevil Eggs in Massachusetts [1]

M. C. Miller and F. R. Shaw [2]

The question of whether or not eggs of alfalfa weevil (Hypera postica (Gyll.)) overwinter and their significance to the spring infestation has received considerable attention in the Northeast, but additional work is necessary before any general statement can be made for the area. Titus (1913) in Utah and Parks (1914) in Idaho claimed that eggs were winter killed; yet Reeves et al. (1916), Reeves (1927), and Webster (1912) in Utah and Snow (1925) in Nevada reported the overwintering of eggs. Essig and Michelbacher (1933) concluded that differences in climatic conditions might account for conflicting reports.

In a study of the alfalfa weevil in the Northwestern United States, Hamlin et al. (1949) agreed with Parks (1914) that small numbers of eggs appearing in October represented the initial oviposition of the new generation weevils; but disagreed with Titus (1913) and Parks (1914) by claiming that most of the eggs survived the winter. Maglitz and App (1957) in Maryland, and Milliron and MacCreary (1955) and Milliron (1956) in Delaware reported overwintering of eggs. Evans (1959) in Virginia claimed that eastern and western weevil populations differed in overwintering habits; "In the West it is the adults which overwinter, while in the East both eggs and adults go through the winter." Shaw (1965) has published a limited amount of information from Massachusetts on fall oviposition and viability of eggs the following spring.

Materials and Methods: Random samples of 50 alfalfa stems were taken at weekly intervals from fields in Berkshire County, Massachusetts, in the spring and fall of 1965. Each stem was picked within one inch of the ground. The stems were stripped of leaves and inspected for oviposition punctures. In view of the difficulty encountered in locating all punctures, the stems were dissected, and eggs were counted under a dissecting microscope. In a number of instances, empty punctures which never contained eggs were found. The empty punctures and the punctures containing eggs were recorded and the number of eggs indicated.

Results: Table I shows data taken in October and November, and April and May 1963 through 1965. Shaw (1965) reported a decrease in oviposition in the fall of 1964 as opposed to oviposition in the fall of 1963 from 670 eggs to 40 eggs. According to the data taken in the comparable period in 1965 oviposition had increased to 170 eggs. Data taken in the spring of 1964 and 1965 indicated little spring oviposition. Between April 7 and May 5 of 1964 and 1965, 16 eggs and six eggs respectively, were found.

Discussion: Although the results seem to indicate that a few eggs overwinter in Massachusetts, analysis of the data in the light of previous work leads us to doubt this conclusion. After controlled environmental experiments, Koehler and Gyrisco (1961) stated that the true minimum effective temperature for incubation of eggs was between 10° and 12° C. No egg hatch occurred at 12° C. below 50 percent humidity. This finding corroborated the 10° C. minimum effective incubation temperature based on field study data by Sweetman and Wedemeyer (1933). Hamlin et al. (1949) noted that apparently oscillation about a temperature of 10° C. promoted the most abundant ovulation: "...the negative phase favoring ovogenesis and the positive phase favoring ovipostion."

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2. Graduate Assistant (Research) and Professor of Entomology and Beekeeping, respectively; Department of Entomology and Plant Pathology.

The data recorded by Shaw for 1963 and 1964 and by the authors for 1965 indicate oviposition into the fall. According to Hamlin et al. (1949) this may continue until the daily temperature remains below 10° C. Since the daily temperature during the Massachusetts winter remains below 10° C. for long periods, oviposition can not occur during such conditions; and according to the findings of Koehler and Gyrisco (1961), if eggs were laid they would not hatch.

The work of Hamlin et al. (1949), Sweetman and Wedemeyer (1933), and Koehler and Gyrisco (1961) substantiate the supposition that oviposition could occur in the early spring if the temperature rose to approximately 10° C. The presence of a few eggs in stems gathered from the fields in the early spring is, therefore, not inconsistent with the statement that overwintering of eggs in Massachusetts is highly improbable.

Since eggs can not develop until a temperature of 10° C. to 12° C. has been attained; and since oviposition commences at this temperature, the overwintering of eggs, if any, could have little effect on the spring infestation.

TABLE I

ALFALFA WEEVIL OVIPOSITION

NEW MARLBORO, MASSACHUSETTS

FALL 1963

Date	No. Punctures	No. Eggs
Oct 2	45	225
Oct 17	38	90
Oct 24	37	81
Oct 31	63	93
Nov 10	69	151
Total	252	670

SPRING 1964

Date	No. Punctures	No. Eggs
Apr 7	36	6
Apr 16	101	0
Apr 22	116	0
May 5	111	10
Total	364	16

FALL 1964

Date	No. Punctures	No. Eggs
Oct 1	3	0
Oct 15	2	0
Oct 22	2	0
Oct 29	5	40
Nov 11	4	0
Total	16	40

SPRING 1965

Date	No. Punctures	No. Eggs
Apr 8	0	0
Apr 15	1	0
Apr 21	2	0
Apr 28	2	1
May 5	1	0
Total	6	1

FALL 1965

Date	No. Punctures	No. Eggs
Oct 9	2	31
Oct 14	0	0
Oct 20	8	18
Oct 21	5	19
Oct 26	7	38
Nov 2	5	27
Nov 10	5	37
Total	32	170

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